CHAPTER IV
RESEARCH METHODOLOGY

4.1 Research Design

The present research is an attempt to make the comparison between high creative and less creative associates in relation to their Interpersonal relations, Conflict Resolution Modes, Decision Making, Motivation, Commitment and Performance. A 2 X 4 X 3 factorial design (with unequal numbers) (Figure 4.1) was planned. Two levels of Creative Associates (High Creative & Less Creative), four different sectors (service, manufacturing, Consumer Durables and Petrochemical units) were taken. Under each single unit three levels of associates i.e. senior level, middle level managers and lower level associates were taken.

4.2 Sample

The present study was conducted on a sample of 400 associates drawn from four different Sectors. The sample of 400 associates was divided into 200 High Creative and 200 Less Creative. Out of this sample, 100 associates were taken from Manufacturing Sector, 100 from Service, 100 from Consumer durables and 100 from Petrochemical Sector. For the study equal number of samples were taken at each level as per Allen Louis Edward’s (1950) factorial design of equal number. The equal numbers continued from High and Less Creative criterion groups (200 each) to equal numbers at the sectorial level (100 each). Further the ratio of 1:3:6 was taken for picking up the sample from senior level, middle level and entry level managers as per popular cadre ratio.

The technique of ‘Stratified Systematic Sampling’ was adopted in selecting samples from middle level and lower level management . However for senior management ‘Random Sampling’ was used since stratified systematic sampling was not possible for them. The senior level management consisted of managers having experience of more than 25 years. The middle level management consisted of divisional managers, assistant divisional managers, area managers, senior branch managers, branch managers, and assistant branch managers, having work experience of seven to 25 years The entry level manager consisted of programmers, assistant administrative
officers, development officers and supervisors, executives, having work experience of 1 to 7 years. The design of the sample is shown in Figure 4.2.

Sample Size was Determination by Godden’s formula

As per Godden (2004) Formula for determining the sample size when population is greater than 50,000 or infinite.

\[
SS = \frac{Z^2 \times (P) \times (1 - P)}{C^2}
\]

- **SS** = Sample Size
- **Z** = Z-value (e.g., 1.96 for a 95 percent confidence level)
- **P** = Percentage of population picking a choice, expressed as decimal
- **C** = Confidence interval, expressed as decimal (e.g., .05 = +/- 5 percentage points)
- A Z-values (Cumulative Normal Probability Table) represent the probability that a sample will fall within a certain distribution.

- The Z-values for confidence levels are:
  - 1.645 = 90 percent confidence level
  - 1.96 = 95 percent confidence level
  - 2.576 = 99 percent confidence level

Example:

\[
SS = \frac{3.8416 \times .5 \times .5}{.0025}
\]

\[
SS = 384
\]

As per above formula when population is infinite a sample of 384 is appropriate if confidence interval is 95 percent, and probability of picking a choice is taken as 50%. However the sample taken for this study is above 384.
Figure 4.1: A 2 X 4 X 3 Factorial Design
<table>
<thead>
<tr>
<th></th>
<th>HIGHLY CREATIVE</th>
<th>LESS CREATIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td><strong>ASSOCIATES</strong></td>
<td>Automobile Industry</td>
<td>F.M.C.G Industry</td>
</tr>
<tr>
<td><strong>Entry Level Manager</strong></td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td><strong>Middle Level Manager</strong></td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td><strong>Top Level Managers</strong></td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>50</td>
<td>50</td>
</tr>
</tbody>
</table>

**TOTAL: 400**

Figure 4.2: Sample Distribution
4.3 Tools Used

The following tests were used in the study:

1. Abbreviated Torrance Test for Adults (Goff & Torrance, 2002)
2. Motivation Analysis Test (Cattell et al., 1964)
3. The Fundamental Interpersonal Relations Orientation-Behavior (William Schutz, 1958)
5. Organizational Commitment Questionnaire (Mowday et al., 1979)
6. Performance Evaluation Form (Prof. Anu Singh Lather)
7. Decision Making Style Questionnaire (designed by the Supervisor and Investigator)

Abbreviated Torrance Test for Adults (Goff & Torrance, 2002)

Abbreviated Torrance Test for Adults (ATTA) was developed by Goff & Torrance in the year 2002. This test was developed because the original TTCT often requires considerable testing time (45 minutes for the Verbal and 30 minutes for the Figural). The ATTA is compromised of one Verbal and two Figural exercises and respondents are given 3 minutes to answer each question.

Responses to the three questions in the ATTA are scored under two categories: Norm referenced (NR) measures and Criterion – referenced (CR) measures.

The Norm referenced measures are those that are exhibited in every response to some varying degree. The norm referenced measures assess the following four areas:

- Fluency – is the capability to produce large number of ideas both verbally and figurally which are pertinent to the task.
- Originality – is the ability to produce unusual or novel ideas.
- Elaboration – is the ability to embroider ideas with details, rather than being restricted to the core idea.
• Flexibility – is the ability to process the given information in various ways
  given the same stimulus.

The criterion – referenced creativity indicators, may or may not be evidenced on any
given record. In all, there are fifteen CR indicators are explained below:

The following five criterion referenced creativity indicator are for question #1. They
are scored under the following headings:

• Richness and Colorfulness of Imagery – this is defined as the variety,
  vividness, and strength or imagery.

• Emotion/Feelings – the ability to walk or fly on air might make other
  “jealous” of their ability or the respondents might express feelings “queasy”
  or “lazy”.

• Future Orientation – this occurs when future consequences are projected.

• Humor: Conceptual Incongruity – a response is scored if it is funny or make
  the scorer laugh.

• Scoring Provocative Questions – this is the response that is phased in the
  form of a question that makes a person think of an object or situation from a
different point of view.

For Exercises #2 and #3 there are 10 CR measures. The explanation of these
measures are as follows:

1. Openness: Resistance to Premature Closure – closure is the tendency to
   connect two points early in the creation of the design.

2. Unusual Visualization, Different Perspective - objects that are viewed from
   above, underneath, at an unusual angle, at different distances or in an unusual
   position are examples of this measure.

3. Movement and/or Sound – incorporating movement or sound in the figure
   response is seen as a creative strength.
4. Richness and/or Colorfulness of Imagery – Responses are scored for richness when they show vividness, liveliness and intensity and are scored for colorfulness when they appeal to the senses of touch, smell or sight.

5. Abstractness of Titles – titles are classified into 4 levels of abstractness: Level 1 titles simply gives the name of the object, frequently a single word, Level 2 titles gives the name of the object, and adds a simple description, while Level 3 titles go beyond a pure description, adding some interpretation, and Level 4 titles give an abstract interpretation, going beyond the object itself.

6. Context : Environment for Object, Articulateness in Telling a Story – A creative person must be able to communicate clearly and powerfully and to do so there must be sufficient detail to tell a story.

7. Combination/Synthesis of Two or More Figures – A measure of this ability is evidenced in Activity#2 when the two incomplete figures are combined into a single object or scene.

8. Internal Visual Perspective – Creative people visualize beyond exteriors and pay attention to the internal and the dynamic workings of things (Giff & Torrance, 2002).

9. Expressions of Feelings and Emotions – In the figures, feelings and emotions may be expressed through the speech of people or animals while nonverbal clues include facial expressions or body posture.

10. Fantasy – this indicator appears frequently in the form of cartoon characters, fairy tale characters or episodes from science fiction or myths.

Reliability

Reliability is “concerned with the extent to which the measure would yield consistent results each time it is used” (Ary et al., 2002, p. 227). “Test reliability relates to the consistency with which a test actually measures what it is assessing” (Scholastic Testing Manual, 2002, p. 33). Reliability suggests an instrument offers consistent measurement (Ary et al., 2002) “Test reliability relates to the consistency with which a test actually measures what it is assessing” (Scholastic Testing Manual, p. 33).
There are two primary kinds of reliability: internal and test-retest. The former provides a measure of the consistency of a set of items; the more homogeneous the set of items and the more of them (i.e. the longer the test), the higher the reliability. Test – retest reliability is the measure of the consistency of a set of scores in a given population over time and is often referred to as stability.

Validity

Validity is the assumption that instruments truly measure what they are intended to measure (Ary et al., 2002). Validity is “the most important consideration in developing and evaluation measuring instruments” (Ary et al., p. 242). In addition, validity requires both face and content validity. Face validity suggests the instruments “appear valid for its intended purpose” (Ary et al., p. 409). Content validity suggests that the questionnaire measures what it purports to measure. Validity is the assumption that the indented measurement was indeed measured by the instrument. According to the Classical Test Theory, validity attempts to minimize the systematic, non-random error.

Abbreviated Torrance Test for Adults (ATTA)

Reliability

Test reliability of the raw scores representing composite scores on the ATTA can be evidenced by the KR21 reliability coefficient (found on Table 1) (Goff & Torrance, 2002). The KR21 reliability coefficients for the ATTA were: “fluency = .45; originality = .38; elaboration = .84; flexibility = .38 and total creativity indicators =.69” (Goff & Torrance, p. 35).

Table 4.1: Reliability Information for ATTA Composite Raw Scores

<table>
<thead>
<tr>
<th>Score</th>
<th>Mean</th>
<th>Sigma</th>
<th>KR21</th>
<th>SEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Abilities</td>
<td>34.30</td>
<td>11.53</td>
<td>.84</td>
<td>4.63</td>
</tr>
<tr>
<td>Total Abilities +Indicators</td>
<td>44.14</td>
<td>14.78</td>
<td>.90</td>
<td>4.76</td>
</tr>
</tbody>
</table>
Another important form of reliability is called rater reliability. With the complexity of the scoring procedures associated with the test, it is necessary to determine the extent of agreement of scores when records have been scored independently by several scorers. This agreement, which can be shown in terms of a coefficient of correlation, is referred to as the rater reliability. Interrater reliability ranges from .95 to .99 (Goff and Torrance, 2002).

Validity

The validity of this study was enhanced by the use of a standardized instrument. The ATTA was developed from the TTCT and both content and face validity have been established by the Scholastic Testing Service (Goff & Torrance).

**Motivation Analysis Test (Cattell et al., 1964)**

This scale was prepared by Raymond B. Cattell, John L. Hard with assistance of Arthun B. Sewny and John A. Red Cliffe in 1964. It measures ten motivational dimensions in which five are ERGS and five are SENTIMENTS. (REFER THE TABLE). Specifically, the MAT assesses 28 attitudes. Two attitudes are considered by each scale with the exclusion of Self-Sentiment and Superego. Eight attitudes are assessed for Self-Sentiment and four attitudes are assessed for Superego. These attitudes were chosen on the basis of their correlation with their respective motivational factor. The test is administered individually.

**Table 4.2:** Scales and explanations for MAT

<table>
<thead>
<tr>
<th>SCALES AND EXPLANATION FOR THE MOTIVATION ANALYSIS TEST</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ERGS - symbolizes a set of attitudes which are directed toward a biological goal.</strong></td>
<td><strong>SENTIMENTS – symbolizes the set of attitudes and values which are a product of socialization.</strong></td>
</tr>
<tr>
<td>1. Mating Erg (Ma) - measures the strength of the normal heterosexual or mating drive.</td>
<td>1. Self-Sentiment (SS) - measures level of concern about self-control, self-understanding, and social repute.</td>
</tr>
<tr>
<td>2. Assertiveness Erg (As) – measures the strength of the drive to self-assertion, mastery, and achievement.</td>
<td>2. Superego sentiment (Se) - assesses the level of conscience development.</td>
</tr>
</tbody>
</table>
3. Fear – Escape Erg (Fr) - measures the level of alertness to external dangers, interest in the avoidance of illness, accident, loss of financial security, military threats and death.

3. Career sentiment (Ca) - measures the amount of development of interest in a career. It demonstrates the need to earn a good living/potential to earn a good living/having a useful skill.

4. Narcism – Comfort Erg (Na) - measures the drive to sensuous self-indulgent satisfaction.

4. Sweetheart-spouse sentiment (Sw)-measures the strength of attachment to a spouse or sweetheart.

5. Pugnacity – Sadism (Pg) - measures the level of destructive, hostile impulses.

5. Home-parental sentiment (Ho) - measures the strength of attitudes attached to the parental home.

A total of 208 test items are distributed among four subtests, each requiring separate instructions and timing. The four subsets are:

1) Uses (unintegrated) – is the first subset having 48 items in it.

2) Estimates (unintegrated) – is the second sub test. There are 56 items in it.

3) Paired Words (integrated) – is the third subtest. These are 48 items in it.

4) Information (integrated) – is the fourth subset and has 56 items in it.

U (unintegrated) and I (integrated) are 2 second-order factors which has emerged out of Cattell and Child’s work (1975):

a) U component is the unintegrated, unrestrained, and spontaneous component of concern which is susceptible to transitory stimulation and is part of the unconscious or preconscious. Unintegrated scores are obtained on the basis of uses and estimates subtest’s measurement.

b) The integrated component on the other hand is a relatively firm, reality oriented, cognitively invested, experienced and a consciously integrated and controlled interest component. Integrated scores are obtained on the basis of paired words and information.
Finally, an individual's total motivation in a particular area is the sum of the U and I components.

In addition to there are five derivative (second-order) MAT scores, which are explained in the following paragraph:

1. Total Autism- Optimism - is the sum of 10 Estimates score. Autism- Optimism is the individual’s tendency to distort reality.

2. General Information-Intelligence – is the sum of 10 Information scores. It measures individual's crystallized ability level.

3. Total Integration – is obtained by subtracting the sum the integrated scores from the sum of the unintegrated scores, i.e. sum U - sum I. Total Integration measures the level of satisfaction as compared with drive levels.

4. Total Personal Interest – is the sum of 10 total motivation scores. It measures the overall drive/interest level of an individual.

5. Total Conflict - score is obtained by summing the differences of the individual integrated and unintegrated scores, i.e. sum U - I. It measures the general frustration or low satisfaction level compared with drive level.

Reliability

The test-retest reliabilities over one-week period ranged from .51 for Pugnacity to .81 for Home-parental; test-retest reliabilities over a five-week period ranged from .39 for Career Sentiment to .69 for Self-Sentiment; and internal consistency reliability estimates (coefficient alpha) ranged from .33 for Assertiveness to .71 for Self Sentiment.

Validity

The validity of the scales is based on the correlation between scale scores and their factor estimates. These correlations ranged from .52 for Narcism to .76 for Self-Sentiment (Cattell et al., 1964). They state that the basis for construct validity is established from research in which the dynamic factors were identified. Despite the deficiencies with regard to traditional psychometric standards, Mazer (1972) suggested that the MAT offers much promise as an experimental instrument.
The Fundamental Interpersonal Relations Orientation-Behavior (William Schutz, 1958)

The Fundamental Interpersonal Relations Orientation-Behavior (FIRO-B) is a 54-item instrument designed to measure interpersonal needs on three scales: Inclusion, Control and Affection and two dimensions of wanted and Control, hence we get twelve scores, which is commonly used in interpretation of the result:

- Total Behavior Scores (Total Expressed or Total Wanted)
- Total Need Scores (Total Inclusion, Total Control, Total Affection)
- Individual Cell Scores (eI, wI, eC, wC, eA, wE)
- Overall Need Score – is the total of the six individual cell scores:

  \[ \text{Overall Need} = eI + wI + eC + wC + eA + wE \]

1. Total Behavior Scores (Total Expressed and Total Wanted) - Each Total Behavior Score represents the overall degree to which the person prefers to initiate need-directed behavior (Expressed) versus the degree to which he or she prefers others to initiate those behaviors (Wanted).
   a) Expressed Behavior (E) – is what a person prefers to do, and how much that person wants to initiate action.
   b) Wanted Behavior (W) – is how much a person wants others to initiate action, and how much that person wants to be the recipient.

2. Total Need Scores (Total Inclusion, Total Control and Total Affection) - Total Need Scores, one each for Inclusion, Control and Affection, range from 0 to 18.
   a) Need for Inclusion – is the need to have social interactions, recognition, belonging, participation and associations with others.
   b) Need for Control - refers to the need to lead, take responsibility and influence others or be influenced by them.

3. Need for Affection - refers to the emotional connections between people so as to establish close and warm relationships with others.
4. Individual Cell Scores - Each individual cell scores represents the combination of a need with the Expressed or Wanted dimension of that need. The meaning of the six cells are:

a) Expressed Inclusion need - The extent to which one makes an effort to include others in your group.

b) Expressed Control need - The extent to which one makes an effort to control or influence others.

c) Expressed Affection need - The extent to which one tries to get close to other people.

d) Wanted Inclusion need - The extent to which one wants others to include oneself in their activities.

e) Wanted Control need - The extent to which one is comfortable working in well-defined situations with clear expectations and instructions.

f) Wanted Affection need - The extent to which one wants others to act warmly toward oneself and to take a personal interest in us.

5. The Overall Need score represents the person’s overall need for human interaction. It shows the extent to which the individual consider that other people and human relations can be a source of personal satisfaction or can help attain important goals.

Reliability

The FIRO-B instrument was constructed using Guttman scaling procedures, a more appropriate index of internal consistency is reproducibility. Reproducibility refers to the fact that the Guttman scales, in which the items occur in a certain order, the item responses should be predictable or reproducible from knowledge of the scale scores. According to Guttman, reproducibility is a more stringent criterion than other measures of internal consistency because it requires not only that the items on a scale all measure the same dimension but also that the items occur in a certain order. The usual criterion for reproducibility is 90% - that is, 90% of responses are predictable from knowledge of the scale scores.
The following table shows the reproducibility of the FIRO-B scales based on the samples used by Schutz to develop the FIRO-B instrument, which he described as “mostly college students, plus a small population of Air force personnel” (Schutz, 1978). The reproducibility of all scales is very high and consistent. To aid comparison with other instruments, this table also shows the internal-consistency reliability of the FIRO-B scales based on coefficient alpha and the data from the national sample. All the scales demonstrate good internal-consistency reliability.

Table 4.3: Reliability and Reproducibility of the FIRO-B Scales

<table>
<thead>
<tr>
<th>FIRO-B Scale</th>
<th>Reproducibility</th>
<th>Reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expressed Inclusion</td>
<td>.94</td>
<td>.87</td>
</tr>
<tr>
<td>Wanted Inclusion</td>
<td>.94</td>
<td>.96</td>
</tr>
<tr>
<td>Expressed Control</td>
<td>.93</td>
<td>.93</td>
</tr>
<tr>
<td>Wanted Control</td>
<td>.94</td>
<td>.86</td>
</tr>
<tr>
<td>Expressed Affection</td>
<td>.94</td>
<td>.86</td>
</tr>
<tr>
<td>Wanted Affection</td>
<td>.94</td>
<td>.85</td>
</tr>
<tr>
<td>Mean</td>
<td>.94</td>
<td>.89</td>
</tr>
</tbody>
</table>

Source: Reproducibility coefficients from Schutz (1978), mean sample size = 1,543; alpha reliability coefficients from national sample, mean sample size = 3,029. Sample size differed slightly by scale due to missing data.

Test – Retest Reliability

Below table shows test-retest reliability coefficients in three samples of different ages: junior high school students (Hutcherson, 1965), college students (Schutz, 1978), and adults (reported in Gluck, 1983). The time between tests ranged from two to four weeks, except that eA and wA in the college student sample were based on an interval of one week. These coefficients demonstrate that the FIRO-B score are relatively stable over short period of time, although there is also some degree of change evident. It is not possible to ascertain from these studies to what degree the FIRO-B scores may be sensitive to changes in context or environment because
neither of these variable would be expected to change over the short intervals used here.

Table 4.4: Test – Retest Reliability of FIRO- B

<table>
<thead>
<tr>
<th>Sample</th>
<th>Dimensions/Need</th>
<th>Inclusion</th>
<th>Control</th>
<th>Affection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Junior high school students (n=93)</td>
<td>Expressed</td>
<td>.72</td>
<td>.76</td>
<td>.85</td>
</tr>
<tr>
<td>College Students (n=126)</td>
<td></td>
<td>.82</td>
<td>.74</td>
<td>.73</td>
</tr>
<tr>
<td>Adults (n=112)</td>
<td></td>
<td>.76</td>
<td>.71</td>
<td>.78</td>
</tr>
<tr>
<td>Junior high school students (n=93)</td>
<td>Wanted</td>
<td>.83</td>
<td>.80</td>
<td>.83</td>
</tr>
<tr>
<td>College students (n=126)</td>
<td></td>
<td>.75</td>
<td>.71</td>
<td>.80</td>
</tr>
<tr>
<td>Adults (n=112)</td>
<td></td>
<td>.80</td>
<td>.75</td>
<td>.82</td>
</tr>
</tbody>
</table>

Note: n = 126, elapsed time = 1-4 week.
Source: Samples for adult and junior high school students reported in Gluck (1983). Sample for college students from Schutz (1978).

Validity

The research also support the validity of the instrument. A number of studies have shown the FIRO-B assessment to be related to measures of leadership (e.g., Fiedler’s Least Preferred Co-worker scale, -.43 to .46), personal value such as community service (.05 to .27), and relationships/friendships (-.03 to .27) (Hammer & Schnell, 2000). Additionally, relationships are also found with assessments such as the MBTI Form M instrument (-.56 to .29) and the CPI instrument (-.48 to .51) (Hammer & Schnell, 2000).

Thomas-Kilmann Conflict Mode Instrument (Thomas and Kilmann, 1974)

The Thomas-Kilmann Conflict MODE (Management of Difference Exercise) Instrument (1974) is based on the empirical work of Blake and Mouton in 1964, Lawrence and Lorsch in 1967, and Burke in 1970. This instrument is designed to measure the behavior of an individual when handling interpersonal conflict.
situations. It is administered individually. Two basic dimensions of behavior in situations of conflict was identified: 1) assertiveness, the degree to which one tries to satisfy his/her own concerns, and 2) cooperativeness, the degree to which one attempts to satisfy the concerns of others (Thomas, 1974). Five methods or modes of dealing with interpersonal conflict were developed and defined by the authors to measure the basic dimensions identified. The five modes are:

1) Competing - is assertive and uncooperative in which an individual pursues his or her own concerns at the expense of others. It is power-oriented mode and the focus lies in winning (Thomas, 1974).

2) Accommodating - This mode is unassertive and cooperative and is the contradictory of competing. An accommodating individual abandon his or her own concerns to satisfy the concern of others (Thomas, 1974).

3) Avoiding - This mode is unassertive and uncooperative. In this the individual prefer simply withdraw from a situation, thereby no one’s concerns are satisfied (Thomas, 1974).

4) Collaborating - is both cooperative and assertive which involves working with others to identify a solution that satisfies the concerns of all parties involved (Thomas, 1974).

5) Compromising - is the midway between cooperativeness and assertiveness. In this the individual gives up more than competing but less than accommodating. Compromising involves sharing, with both parties giving up something to develop a mutually acceptable solution.

It consists of 30 sets of paired items, with each item describing one of the conflict styles.

Reliability

Internal consistency coefficients were reported by the authors to be .43 accommodating, .62 avoiding, .58 compromising, .65 collaborating and .71 competing. The average alpha coefficient was reported at .60 for the MODE.
Validity

Ruble & Thomas (as cited in Womack, 1988) determined that the validity of the MODE is supported by correlations shown between the five styles and the two dimensions. It is also supported by correlations between the MODE scores and other related instruments (Kilmann & Thomas 1977; Womack, 1988).

Organizational Commitment Questionnaire

This questionnaire was developed by Mowday, Richard and Porter (1979), and is most widely used measure of Organisational Commitment. It consists of 15 statements, and it tries to measure the commitment level of employees in the organization. The items were rated on a five-point scale ranging from 1 (completely disagree) to 5 (completely agree). The average of the scores for the statement provides the index of OC, higher score indicating stronger OC. The test is administered individually.

Reliability

The reliability of OCQ is determined by Cronbach’s Alpha values which lie between .82 and 93 (Mowday et al., 1992). In addition to this Lam (1998) was able to show a test - retest reliability of .59 over a period of 10 weeks.

Validity

Examinations of validity show a positive result. A number of studies have shown the OCQ assessment to be positively related to measures of job satisfaction, readiness to remain in the organization and negatively correlated to the intention of leaving the organization (Caught et al., 2000; Steers, 1977; Cooke, 1997; Ferris & Aranya, 1983; Pierce & Dunham 1987; Stump & Hartman, 1984).

Decision Making Style

This test was designed by the supervisor and investigator. The purpose of this test is to find out the decision making styles of the associates. This test is administered individually. It is a 25 item scale, of which 8 items relate to directive decision making, 4 items relate to thinking decision making, 6 items relate to analytical
decision making, 4 items relate to impulsive decision making and 3 items relate to rational decision making. The explanation of the five decision making styles are:

Rational Decision Making Style (RDMS) - is a precise, formal, unbiased, analytical process based on objective data. It is a logical, multi step process for systematically selecting the best option among the possible available choices. Rational decisions seek to optimize or maximize utility.

Thinking Decision Making Style (TSDM) - prefers to use mental ability to preside over daily activities, for reasoning purposes, for understanding and solving problems as well. It provides an alternative perspective towards performance and abilities.

Directive Decision Making Style (DDMS) -relies on a rational (but short term perspective) and autocratic style which results in the employee using his own knowledge, experience and judgment to choose the best alternative.

Analytical Decision Making Style (ADMS) - uses direct observation, facts and data to arrive at the best alternative from among the available ones. It is a time consuming as it prefers to look at every possible alternative.

Impulsive Decision Making Style (IDMS) - act on impulse/instinct that mostly relies on affective and physiological cues present in the immediate environment. They make decisions without a great deal of thought and often fail to plan ahead.

It takes approximately 15 minutes to complete this test and can be administered both individually and in group.

Reliability

The reliability coefficient was calculated for the scale and the Conback Alpha was found to be 0.748 and the Spearman Brown Coefficient was found to be 0.806.

The test has high face validity.

Performance Evaluation

The performance evaluation schedule was developed by Prof. Anu Singh Lather. This questionnaire tries to measure the overall performance of the individual on 13
performance criteria. The scoring of the test is done on a 5-point scale, ranging from very high to very low and the scores ranges from 5 to 1.

It takes approximately 10 minutes to complete this test and can be administered both individually and in group.

The reliability coefficient was calculated for the scale and the Conback Alpha was found to be .719 and split half reliability coefficient is 0.722. The test has high face validity.

4.4 Procedure

The subjects for the study were selected by adopting stratified systematic sampling for middle level and lower level associates and random sampling for top level management. The tests were administered in groups and sometimes in some stray case individually. For this first of all a rapport was established with the subjects and then the purpose of the study was explained to them. The instructions for each test were given separately either in groups or individually depending on availability of subjects. For the top management questionnaires were handed over explaining the instructions in details and were collected later on.

Abbreviated Torrance Test for Adults (Goff & Torrance, 2002): The subjects were instructed that “ATTA is comprised of one Verbal and two Figural exercises” and the respondents were given 3 minutes to answer each question. The first question in the ATTA gauges Verbal responses and the participant were asked to create a list of problems that might be created if one could walk on air or fly without being in an airplane or similar vehicle. The second activity, is comprised of two incomplete figures, one which looks like a “curly q” and the other which is comprised of two intersecting lines at a 90 degree angle. The respondents were asked to make pictures with the incomplete figures. The respondents were further advised to make the picture unusual and to communicate as interesting and as complete a story as possible (Goff & Torrance, 2002). The third activity, is a 3*3 matrix of small equilateral triangles. Respondents were asked to see how many objects or pictures they can make from the triangles. The instructions for both activities require that the participants create a title for all of the pictures they create.
**Motivation Analysis Test (Cattell et al., 1964):** The respondents were first of all briefed that, a total of 208 test items are distributed among four subtests. And each subsets required separate instructions and timing. The four subsets are:

1) Uses (unintegrated) - First subtest is uses, each of the items have alternative answers. And testees has to put mark (✓) on selected box. Approximate 15-20 minutes was required to complete it.

2) Estimates (unintegrated) – is the second subset. It requires the respondent to make estimates and select the best option from the given options. The required approximate time for it was 15-20 minutes.

3) Paired Words (integrated) – is the third subtest, it requires that the respondent quickly associate one of a pair of words to a root word, and 4-6 minutes was required to complete it.

4) Information (integrated) – is the fourth subset. This require the respondent to give one best answer from the available options. The total time required to complete it was 15-20 minutes.

**The Fundamental Interpersonal Relations Orientation-Behavior (William Schutz, 1958):** The FIRO-B instrument was administered using self-scorable version. The instrument was administered in groups and in some cases individually. The respondents usually responded to all of the items in about 10 minutes, although some took up to 20 minutes.

A nonthreatening atmosphere was established with the respondents and a brief overview of the purpose of the instruments was explained. It was told to the respondents that FIRO-B instrument was meant for the purpose of understanding how they interacted with others. Further, the following point were emphasized:

1) The items have no right or wrong answers.

2) There is no passing or failing associated with the results.

3) The results are non-judgmental and are to be used for learning and development.

4) The results may provide insights about how people interact with others and how others may perceive them.
The FIRO-B instrument contains 54 items. The respondents were asked to respond to each item using one of two six-point rating scales. One rating scale elicits the frequency with which the respondent engages in the behavior described in the item. The options are: 1) Never 2) Rarely 3) Occasionally 4) Sometimes 5) Often 6) Usually.

The other rating scale elicits selectivity, i.e., how many people the respondent engages in the behavior described in the item. The response options on this scale are: 1) Nobody 2) One or two people 3) A few people 4) Some people 5) many people 6) Most people.

Although the respondent is asked to circle a number from 1 to 6 that best describes his or her behavior, the scale scores are derived using a 0-1 key. The subjects were given 15-20 minutes to complete the test.

**Thomas-Kilmann Conflict Mode Instrument (Thomas and Kilmann, 1974):** The TKI comprises of 30 paired forced-choice statements which makes a total of 60 items. Each item described one of the conflict resolution styles. The respondents were asked to choose the response statement from each pair which best describes the way one would usually behave in conflict situation. The respondents were informed that there are no right or wrong answers. The respondents were given 15 minutes to complete the test.

**Organizational Commitment Questionnaire (Mowday et al., 1979):** Organisational Commitment Questionnaire consists of 15 statements. The subjects were instructed that “There are some statements related to organizational commitment”. Each statement is followed by five alternatives from 1 (strongly agree) to 5 (strongly disagree). The subjects were given 7 minutes to complete the test.

**Decision Making Style:** This test is administered individually. It is a 25 item scale, of which 8 items relate to directive decision making, 4 items relate to thinking decision making, 6 items relate to analytical decision making, 4 items relate to impulsive decision making and 3 items relate to rational decision making. The subjects were instructed that “Here are some statements, which describes the style of decision making of the employees. Each statement has five alternatives- always, mostly, sometimes, rarely and never. You have to select either of the five alternatives
best applied to represent or describe your style of decision making”. The subjects were requested to answer all the statements and they were assured that their responses would be kept totally confidential. Subjects were given 10 minutes to complete this test.

**Performance Index:** The subjects were instructed that “There are 13 statements related to performance criteria of your subordinates”. Each statement is followed by five alternatives- very high, high, medium, low and very low. Indicate to what extent these are present in your immediate subordinates. The subjects were given 10 minutes to complete the test.

### 4.5 Scoring of the Tests

Abbreviated Torrance Test for Adults (Goff & Torrance, 2002): Since, the ATTA is compromised of one Verbal and two Figural exercises. We start with the scoring of verbal response first. And the verbal response, is scored under NR and CR creativity indicators, the first of the norm – referenced (NR) measures to be scored for this exercise is fluency, which is a “simple count of the pertinent responses, scored by judging as to whether or not the response is relevant to the situation or not (Goff & Torrance, 2002). Each relevant response is given 1 point. The next measure to be scored is Originality. If any of the responses are found on the “List of Common Responses for Originality – Activity #1” they are scored a zero while all other responses are given 1 point each. A raw score for this ability is obtained by counting the number of responses not on the list. Elaboration and flexibility are not scored on question #1.

There are five criterion referenced creativity indicator for question #1. They are scored under the following headings: Richness and Colorfulness of Imagery, Emotion/Feelings, Future Orientation, Humor: Conceptual Incongruity, Scoring Provocative Questions. A rating of zero is given if the indicator does not occur, a rating of a single (+) is given for an indicator appearing once, and a rating of double plus (+++) is given for any indicator appearing more than once (Goff & Torrance, 2002).

Activity #2 and #3 are figural responses. Once again the first norm reference measure is fluency. Relevant designs must use the incomplete figure and triangle
printed in the booklet in order to be counted. Responses would be scored a zero if they do not use the designs provided in the space allowed or if they are an abstract design without a specific meaningful title.

Originality is scored by comparing the drawings created to a list of common responses provided by the authors of the ATTA. Some common responses in Activity #2 which would not be scored are birds, animal heads or human bodies for Figure 1 and horses, kites and teepees for Figure 2. In Activity #3, creating designs such as Jack-o’ lanterns, trees, yield signs, houses or ice cream cones would not be added to the tally.

The third norm reference measure to be scored in Activities 2 and 3 is Elaboration. Goff and Torrance (2002) state that the two assumptions that underline the scoring for elaboration are that the minimum and primary response to the stimulus figure in a single response and that the imagination and exposition of detail is a function of creative ability. As a result, credit is given to each pertinent detail added to the original stimulus figure itself (Goff & Torrance, 2002). Color, deliberate shading, and decoration are the elements that are being scored in this measure. For example, showing the shingles on the roof of the house, putting a flower in the hat of a clown, shading in the nose of a clown and putting a door in the house would all garner points towards elaboration.

The fourth norm referenced measure is Flexibility, which is the ability to “process information or objects in different ways, given the same stimulus” (Goff & Torrance, 2002). This score applies only to Exercise #3 and is concerned with the number of different ways the triangles are used. Points would be awarded if the respondent were to draw on the inside of a triangle (creating Swiss cheese or a piece of pie) or draws an object with a substantial appendage from one side (creating a house or an arrow) or if the triangle has multiple appendages (creating the figure of a girl) or enclose multiple triangles (to create a face).

Goff and Torrance (2002) stated that the presence of a criterion reference creativity indicator can be regarded as a creative strength that can be a supplement to the assessment made using the norm referenced measures. The appearance of a strength is indicated by a single plus (+), and a stronger evidence is given by a double plus
The criterion for giving zero credit, a single plus (+), or a double plus (++) is provided in the scoring guidelines for each question. There are designated areas for recording the appropriate scores for both the norm referenced measures and the criteria referenced measures on the scoring/interpretation worksheet.

Torrance selected a nine-point normalized standard score which is the conventional stanine scale used for many testing instruments (Goff & Torrance, 2002, p.30). The nine equal – interval scaled scores contain the following percentages for the adult population: 4%, 12%, 20%, 26%, 30%, 12%, 4% (Goff & Torrance, 2002). The scales use values of 11 through 19 centered at 15, to weigh the indicators in the ATTA as such indicators in the regular TTCT – Figural Test are weighed (Goff & Torrance, 2002). Torrance created the following table for converting ability raw scores (Goff & Torrance, 2002, p.30).

Table 4.5: Converting Ability Raw Scores to Normalized Standard Scores
(Scaled Scores)

<table>
<thead>
<tr>
<th>Creative Ability</th>
<th>Total Score</th>
<th>Scaled Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>Fluency</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Originality</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elaboration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flexibility</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Corresponding Raw Scores

<table>
<thead>
<tr>
<th>Creativity</th>
<th>Fluency</th>
<th>Originality</th>
<th>Elaboration</th>
<th>Flexibility</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1-6</td>
<td>1-2</td>
<td>1-3</td>
<td>-</td>
</tr>
<tr>
<td>Fluency</td>
<td>7</td>
<td>3</td>
<td>4-5</td>
<td>1</td>
</tr>
<tr>
<td>Originality</td>
<td>8-9</td>
<td>4</td>
<td>6-8</td>
<td>2</td>
</tr>
<tr>
<td>Elaboration</td>
<td>10</td>
<td>5-6</td>
<td>9-11</td>
<td>3</td>
</tr>
<tr>
<td>Flexibility</td>
<td>11-12</td>
<td>6-8</td>
<td>12-14</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>13-14</td>
<td>6-8</td>
<td>15-18</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>15-16</td>
<td>6-8</td>
<td>19-23</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>17</td>
<td>6-8</td>
<td>24-27</td>
<td>6+</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>6-8</td>
<td>28+</td>
<td></td>
</tr>
<tr>
<td></td>
<td>19</td>
<td>6-8</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The mean scaled scores for each of the four abilities is approximately 15 and the standard deviations for all four was approximately 2 (Goff & Torrance, 2002). The data demonstrates that the scales for the four abilities are essentially the same, allowing direct compromise across four creative abilities (Goff & Torrance, 2002).
Table 4.6: Scaled Score Means, Standard Deviations (Sigma), and Selected Percentile Points for the Creative Abilities

<table>
<thead>
<tr>
<th>Test</th>
<th>Mean</th>
<th>Sigma</th>
<th>.05</th>
<th>.16</th>
<th>.25</th>
<th>.40</th>
<th>.50</th>
<th>.60</th>
<th>.75</th>
<th>.84</th>
<th>.95</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluency</td>
<td>15.011</td>
<td>1.90</td>
<td>11.6</td>
<td>12.9</td>
<td>13.6</td>
<td>14.6</td>
<td>15.2</td>
<td>15.7</td>
<td>16.4</td>
<td>17.0</td>
<td>18.1</td>
</tr>
<tr>
<td>Originality</td>
<td>15.149</td>
<td>2.14</td>
<td>11.4</td>
<td>12.7</td>
<td>13.5</td>
<td>14.6</td>
<td>15.3</td>
<td>16.0</td>
<td>16.8</td>
<td>17.5</td>
<td>18.6</td>
</tr>
<tr>
<td>Elaboration</td>
<td>15.116</td>
<td>1.93</td>
<td>11.7</td>
<td>13.1</td>
<td>13.7</td>
<td>14.6</td>
<td>15.1</td>
<td>15.7</td>
<td>16.6</td>
<td>17.2</td>
<td>18.5</td>
</tr>
<tr>
<td>Flexibility</td>
<td>15.274</td>
<td>1.86</td>
<td>11.8</td>
<td>13.3</td>
<td>14.0</td>
<td>14.6</td>
<td>15.0</td>
<td>15.8</td>
<td>17.0</td>
<td>17.5</td>
<td>18.3</td>
</tr>
</tbody>
</table>

The Creativity Index is used to create a standard single score to illustrate individual level of creativity. The creativity index is obtained by adding the total scaled score from the four norm-referenced measures to the total number of criterion referenced creativity indicators.

To facilitate interpretation of the Creativity Index, a broader 7-point normalized standard score scale was developed. In addition, a verbal assessment of each point of the scale was given, along with the percent of the adult sample falling into that category (Table 3) (Goff & Torrance, 2002).

Table 4.7: Conversion of Creativity Index to Scaled Score and Related Interpretive Information

<table>
<thead>
<tr>
<th>Creativity Index</th>
<th>1-50</th>
<th>51-59</th>
<th>60-70</th>
<th>71-73</th>
<th>74-77</th>
<th>78-84</th>
<th>85+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creativity Level</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Verbal Assessment</td>
<td>Minimal</td>
<td>Low Below Average</td>
<td>Average</td>
<td>Above Average</td>
<td>High</td>
<td>Substantial</td>
<td></td>
</tr>
<tr>
<td>% Adults in Level</td>
<td>4%</td>
<td>12%</td>
<td>20%</td>
<td>26%</td>
<td>20%</td>
<td>12%</td>
<td>4%</td>
</tr>
</tbody>
</table>

Motivation Analysis Test (Cattell et al., 1964) - The test was scored as per the manual.
The Fundamental Interpersonal Relations Orientation-Behavior (William Schutz, 1958) :FIRO - B measures interpersonal needs on three scales: Inclusion, Control, and Affection and two dimensions of wanted and Control, hence we get twelve scores, which is commonly used in interpretation of the result:

1. The Overall Need score - can range from 0 to 54

Table A: shows the various categories falling under different Overall Need Scores and the meaning associated with each.

*Table 4.8: Score ranges, Category Labels and meaning of overall need scores*

<table>
<thead>
<tr>
<th>Score Range</th>
<th>Category</th>
<th>Meaning</th>
</tr>
</thead>
</table>
| 0-15        | Low      | • Involvement with others is not a primary source of need satisfaction  
             |          | • Other needs, e.g., intellectual stimulation or solitary pursuits, predominate  
             |          | • Tend to need privacy to do their best work  
             |          | • Prefer to keep to themselves and tend to have a small circle of friends  
             |          | • Highly selective about how often and whom they interact. |
| 16-26       | Medium - Low  
             |          | • Involvement with others is sometimes a source of satisfaction, depending on the people and the context  
             |          | • Work most effectively alone, but with others when the objectives are focused.  
             |          | • Tend to have a small circle of friends whom they see occasionally. |
| 27-38       | Medium - High  
             |          | • Involvement is usually a source of satisfaction  
             |          | • May enjoy small group work settings  
             |          | • Tend to have a larger group of friends and may contact them on a regular basis |
| 39-54       | High      | • Involvement with others is enjoying and satisfying.  
             |          | • Engage in interpersonal interaction with many people and on a frequent basis. |
2. Total Need Scores (Total Inclusion, Control and Affection) - Total Need Scores, one each for inclusion, Control and Affection, range from 0 to 18. Low score ranges from 0-5, medium from 6-12 and high from 13-18.

3. Individual Cell Scores – The score in each of the six cells range from 0 to 9. Low scores range from 0-2, medium scores 3-6 and high scores from 7-9.

Thomas-Kilmann Conflict Mode Instrument (Thomas and Kilmann, 1974) : An individual score for each style is the number of times that style is chosen. The scores range from 0 (very low use) to 12 (very high use).

*Table 4.9 : Range of scores for FIRO-B*

<table>
<thead>
<tr>
<th>Style</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competing</td>
<td>0 to 3</td>
<td>4 to 7</td>
<td>8 and above</td>
</tr>
<tr>
<td>Collaborating</td>
<td>0 to 5</td>
<td>6 to 9</td>
<td>9 to 12</td>
</tr>
<tr>
<td>Compromising</td>
<td>0 to 4s</td>
<td>5 to 8</td>
<td>9 to 12</td>
</tr>
<tr>
<td>Avoiding</td>
<td>0 to 4</td>
<td>5 to 7</td>
<td>8 to 12</td>
</tr>
<tr>
<td>Accommodating</td>
<td>0 to 3</td>
<td>3 to 6</td>
<td>6 to 12</td>
</tr>
<tr>
<td>bottom 25%</td>
<td>average (the middle 50%)</td>
<td>top 25%</td>
<td></td>
</tr>
</tbody>
</table>

The Thomas-Kilmann Conflict MODE (Management of Difference Exercise) Instrument (1974) consists of 30 sets of paired items, with each item describing one of the conflict styles. An individual score for each style is the number of times that style is chosen. The scores range from 0 (very low use) to 12 (very high use). In competing, low scores range from 0 to 3, medium scores from 4 to 7 and high scores 8 and above, in collaborating, low scores fall from 0 to 5, medium from 6 to 9 and high from 9 to 12, in compromising, low scores fall from 0 to 4, medium scores from 5 to 8 and high from 9 to 12, in avoiding, low scores fall from 0 to 4, medium scores from 5 to 7 and high scores from 8 to 12 and in accommodating, low scores fall from 0 to 3, medium scores from 3 to 6 and high scores from 6 to 12. The scores in the medium range reflect the average (the middle 50%). Low scores (low preferences)
fall in the bottom 25% and high scores (high preferences) fall in the top 25% as represented by the original norm group. The norm group was composed of managers at middle and upper levels of business and government organizations.

Very high or very low scores are not necessarily bad as life situations sometimes call for greater or minimal use of one conflict-handling mode over another. All five modes are beneficial in some situations. Each of us is capable of using all five conflict-handling modes, however, each of us tend to use some modes more than others and to use them more effectively than others whether from practice or a personality preference (Thomas & Kilmann, 1974).

Organizational Commitment Questionnaire (Mowday et al., 1979) : It consists of 15 statements, out of 15, 6 statements are negatively phrased and reversely scored to reduce response bias. The items were rated on a five-point scale ranging from 1 (completely disagree) to 5 (completely agree). The average of scores for the statement provides the index of OC, higher score indicating stronger OC.

Decision Making Style : It consist of 25 item scale and is rated on a 5 point scale. Questionnaire consisted of positive and negative key item. The response alternatives ranged in five categories from “always to never”. Positive key item carried a score of five if the response was in the category of “always” and carried a score of one if the response was in the category of “never”. While the reverse pattern of scoring was followed for the negative key items. Thus, in this test, high score in a particular category indicates a high level of that particular decision making style.

Performance Index: It consist of 13 statements indicating various performance criteria. It is scored on a 5 point scale ranging from very high which scored 5 on the scale to very low which scored 1 on the scale. Questionnaire consisted of positive key item. Thus, in this test, a high score indicate high level of performance and low scores indicate a lower level of performance.